

REMARKS

Status of the Claims.

Claims 1, 3-19, and 21-32 are pending with entry of this amendment, claims 2 and 20 being cancelled and no claims being added herein. Claims 1 and 17 are amended herein. These amendments introduce no new matter. Support is replete throughout the specification (*e.g.*, in claims 2 and 20 as originally filed).

35 U.S.C. §112, First Paragraph, Description requirement.

Claims 1-32 were rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed, had possession of the claimed invention (description requirement). Applicants traverse.

It is well accepted law that the description requirement of section 112 is met when “one of skill in the art would discern possession of the invention at the time of filing.” As stated by the Court of Appeals of the Federal Circuit:

After *Enzo*, this court recognized “that *Ely Lilly* did not hold that all functional descriptions of genetic material necessarily fails as a matter of law to meet the written description requirement, rather, **the requirement may be satisfied if in the knowledge of the art the disclosed function is sufficiently correlated to a particular, known structure.**” *Amgen*, 314 F.3d at 1332, 1361 (dissent: “[T]he majority . . . verges on confining *Ely Lilly* to its facts.”).

In this case, as in *Enzo*, the court explained that the written description requirement is satisfied when “**one of skill in the art would discern possession of the invention at the time of filing.**” [emphasis added] (*Moba, B.V., Staalkat, B.V., And Fps Food Processing Systems, Inc., V. Diamond Automation, Inc.*, ___ USPQ2d ___ (Fed. Cir. 2003).

Contrary to the Examiners assertion, Applicants provide numerous examples of a lyase domain in an apoprotein. As stated in the specification, at page 7, line 30, through page 8, line 8:

The preferred apoproteins of the invention typically consist essentially of a chromophore domain. The terms “**chromophore domain**” or “**minimal chromophore domain**” or “**lyase domain**” refer to the apoprotein N-

terminal subsequence sufficient for lyase activity and thereby form a covalent bond between the apoprotein and the bilin. Lyases are enzymes that catalyze the reversible formation of a covalent adduct between a hydroxyl- or thiol-containing substrate and a substrate containing a double bond (i.e. addition of a nucleophile to a double bond). Chromophore domains are typically between about 180 and about 250 amino acids, typically between about 190 amino acids and about 220 amino acids, and usually about 200 amino acids in length (e.g., 197 amino acids). Typically, this spontaneous assembly results in the formation of a phytofluor.

At page 40 the specification states:

Underlining in each sequence indicates location of the chromophore domain. Potential cysteine attachment sites are indicated in boldface.

And proceeds to list 8 cyanobacterial sequences (cph1, cph2, cph3, cph4, cph6, cph6, cph7, cph8) showing a highlighted chromophore (lyase) domain.

In addition, Figure 2 shows a multiple sequence alignment of the chromophore (lyase) domains of representative eukaryotic phytochromes the Arabidopsis (At) phyA, phyB/D, phyC and phyE proteins and the green algal phytochrome (Mcphy1b) and the cyanobacterial phytochrome sequences of the invention, cph1-2 and cpl1-6." Thus, contrary to the Examiners assertion, the specification shows numerous examples of the claimed invention:

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|----------|-------------|
| 1) Cph1 | 9) AtphyA |
| 2) Cph2 | 10) AtphyB |
| 3) Cph3 | 11) AtphyC |
| 4) Cph4 | 12) AtphyD |
| 5) Cph5 | 13) AtphyE |
| 6) Cph6, | 14) Mcphy1b |
| 7) Cph7 | |
| 8) Cph8 | |

Having reduced to practice fourteen species comprising each of the major groups recited in claims 1 and 17 (as amended herein) and having provided a multiple sequence alignment of

these chromophore (lyase) domains, one of ordinary skill in the art would readily appreciate that Applicants were in possession of the claimed invention at the time of filing. Accordingly, Applicants believe they have met the description requirement of 35 U.S.C. §112, first paragraph and respectfully request that this rejection be withdrawn.

If the Examiner wishes to maintain this rejection, he is requested to identify for the record, just how many species he believes would be required to support the presently pending claims.

In view of the foregoing, Applicants believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. Should the Examiner seek to maintain the rejections, Applicants request a telephone interview with the Examiner and the Examiner's supervisor.

If a telephone conference would expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (510) 769-3513.

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Respectfully submitted,



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